

Application No. 09/560294
Amendment dated June 16, 2006
After Final Office Action of April 21, 2006

Docket No.: 013217.0127ClUS
(Nelsen 3)

REMARKS

Claims 1, 3 - 7, 9 - 13, and 15 - 18 are pending in this application.

In a Final Office Action mailed 21 April 2006, the Examiner rejected claims 1, 6, 7, 12, 13, and 18 under 35 USC 102(b) as being anticipated by Bodin et al. (US Patent No. 5,241,685). The Examiner further rejected claims 3 - 5, 9 - 11, and 15 - 17 under 35 USC 103(a) as being unpatentable over Bodin et al. (US Patent No. 5,241,685) in view of Hsu et al. (US Patent No. 6,169,898). Applicant has amended independent claims 1, 6, 11 to recite structure that clearly differentiates Applicant's invention from the cited references.

The Examiner noted with respect to independent claim 1:

Regarding claim 1, Bodin et al disclose a system for load balancing, for wireless communication networks having a plurality of cells (c1-c10), each cell adapted to serve a plurality of mobile subscriber stations (col. 2, lines 50-64), comprising:

means, responsive to receipt of a service request from a mobile subscriber station (m1-m9), for establishing a communication connection for said requesting mobile subscriber station via at least one of said plurality of cells (col4, lines 37-40),

means for determining when assignment of said mobile subscriber station to a cell results in a predetermined threshold (critical value X) being exceeded, comprising:

means for measuring a traffic load (measuring traffic occupancy level) in the cell (col. 8, lines 34-39),

means for comparing (at step 102) said measured traffic load to a predetermined traffic load threshold (col. 8, lines 34-39),

means, responsive to said predetermined threshold (X) being exceeded, for identifying at least one of a plurality of mobile subscriber stations served by the cell for reassignment to another cell (cell with lowest occupancy level selected) based upon the class of service of the plurality of mobile subscriber stations (col. 8, lines 37-51).

The Examiner further noted:

Regarding independent claims 1 and 7, applicant states that the cited reference Bodin et al (US 5,241,685), do not disclose the "identifying at least one of a plurality of mobile stations served by the cell for reassignment to another cell". The examiner respectfully disagrees. In col. 5, lines 1-15 of the Bodin reference states that "When the call is determined, the MSC looks for an idle voice

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channel in the cell. If all voice channels are busy at the moment, the next best cell is taken providing that it fulfills the criteria, when the voice channel has been selected an order to start the transmitter in the base station is issued to the new cell. Then an order to the mobile station for turning to the selected voice channel is sent. The base station in the new cell and the mobile then can communicate". Therefore, in other words, an order to a specific mobile station to turn to the selected voice channel in the reassigned new cell which reads on the claimed passage above.

Applicant has reviewed the cited references and the Examiner's stated grounds of rejection, has amended the independent claims, and presents the following arguments in support of patentability of Applicant's claims.

Applicant's load balancing system dynamically and continually balances the traffic load among a plurality of cell sites by using multiple criteria to determine which cell site is selected to provide service to each mobile subscriber station. Applicant's load balancing process is executed in response to the wireless communication network executing the standard service provision process of assigning a cell site to provide service to a mobile subscriber station based upon signal strength (the primary criteria used in assigning a cell site to serve a mobile subscriber station). It is then determined whether this cell site assignment results in a secondary criteria being exceeded. If a secondary criteria is exceeded by the assignment, the mobile subscriber station and/or other mobile subscriber stations are selected, based on the class of service of the mobile subscriber stations operating in the cell site, then one or more mobile subscriber stations with the lowest class of service are handed off to other cell sites. Applicant's load balancing process is executed to automatically hand off the newly served mobile subscriber mobile subscriber station and/or other selected mobile subscriber stations to other cell sites to cause the secondary criteria to be reduced below the predetermined threshold for this criteria.

In contrast, the cited Bodin et al. Patent discloses a mobile cellular radio system in which load balancing comprises dynamically moving the borders between any two cells such that an overloaded cell becomes smaller and the neighboring cell larger achieve balancing. Lowering the entering signal strength threshold for handoff to the neighboring cell and/or increasing the entering signal strength threshold for handoff from the neighboring cell achieves this. Thresholds are unique for any two cells. As noted in column 2, lines 35 - 49:

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The present invention overcomes the shortcomings of the prior art by dynamically adjusting signal strength thresholds of the various cells in a cellular telephone system to balance traffic. Mobile stations are not ordered to handoff to neighbor cells, but the parameters governing the normal handoff procedures are modified. By adjusting the signal strength thresholds, which are designed to be individual or unique between any two cells (one cell may have as many thresholds as it has neighbor cells), the present invention can effectively increase and decrease the distance from the base station to all sides of the cell. By changing the distance to the sides of the cell, the system can change cell shapes in order to increase or decrease the use of available voice channels in cells which are adjacent to each other. [emphasis added]

Thus, the Bodin et al. Patent teaches away from Applicant's claimed "means, responsive to said predetermined traffic load threshold being exceeded, for identifying at least one of a plurality of mobile subscriber stations served by said cell for reassignment to another cell, comprising: means for identifying a one of said plurality of mobile subscriber stations served by said cell with the lowest class of service." The Bodin et al. Patent fails to identify any specific mobile subscriber station for relocation to another cell site, and simply relies on expanding and contracting the cells to vary the number of subscribers served by each cell. Furthermore, the Bodin et al. Patent fails to use the mobile subscriber station class of service as the parameter to select a mobile subscriber station to handoff to another cell site. For example, the Bodin et al. Patent teaches in column 8, lines 37 - 50:

But if the occupancy level of the considered cell is higher than the critical value X, the flow continues down to 103. If there are no neighbor cells with lower occupancy than the previous considered cell, no action is taken and the flow continues at step 108. If however, cells with lower occupancy are available the flow continues to step 104. At step 104 a neighboring cell with the lowest occupancy level is selected and at steps 105 and 106 the entering thresholds are adjusted. At step 105 the entering threshold of the considered neighboring cell when coming from the overloaded cell is lowered. At step 106 the entering threshold of the overloaded cell relative to the considered neighboring cell is increased.

Thus, the Bodin et al. Patent specifically teaches away from Applicant's claimed invention, therefore failing to satisfy the requirements for an anticipation rejection under 35 U.S.C. §102(b).

In order to illustrate the correspondence between the above-presented arguments and Applicant's claims, the following claim chart is used to identify the language in Applicant's claim 1

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that is neither shown nor suggested by the teachings of the cited Bodin et al. Patent. These differences are highlighted by underlining.

Applicant's claim 1

A system for load balancing for wireless communication networks having a plurality of cells, each cell adapted to serve a plurality of mobile subscriber stations, comprising:

means, responsive to receipt of a service request from a mobile subscriber station, for establishing a communication connection for said requesting mobile subscriber station via at least one of said plurality of cells;

means for determining when assignment of said mobile subscriber station to a cell results in a predetermined traffic load threshold being exceeded, comprising:

means for measuring a traffic load in said cell,

means for comparing said measured traffic load to a predetermined traffic load threshold;

means, responsive to said predetermined traffic load threshold being exceeded, for identifying at least one of a plurality of mobile subscriber stations served by said cell for reassignment to another cell, comprising:

means for identifying a one of said plurality of mobile subscriber stations served by said cell with the lowest class of service;
and

means for initiating a handoff of said one of said plurality of mobile subscriber stations served by said cell to another cell in said wireless communication network.

Bodin et al. Patent

The Bodin et al. Patent teaches a system for load sharing in a cellular communication network that has a plurality of cells.

The system of the Bodin et al. Patent establishes a communication connection for a mobile subscriber station that requests service via at least one of the plurality of cells.

The system of the Bodin et al. Patent determines when assignment of a mobile subscriber station to a cell results in a predetermined traffic load threshold being exceeded.

The system of the Bodin et al. Patent measures the traffic load in a cell.

The system of the Bodin et al. Patent compares the measured traffic load to a threshold.

The system of the Bodin et al. Patent modifies the extent of the cell to cause the handoff of mobile subscriber stations that are operating in that cell to another cell.

The system of the Bodin et al. Patent fails to show or suggest class of service as a determining factor in handoffs.

The system of the Bodin et al. Patent executes handoff operations on mobile subscriber stations.

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Applicant believes that independent claim 1 is therefore allowable under 35 U.S.C. §102(b) over U.S. Patent No 5,241,685 issued to Bodin et al. In addition, independent claims 7 and 13 are believed to be allowable under 35 U.S.C. §102(b) over the Bodin et al. Patent for the reasons noted above with respect to claim 1. Furthermore, Applicant believes that claims 6, 12, and 18 are also allowable under 35 U.S.C. §102(b) over the Bodin et al. Patent, and claims 3 - 5, 9 - 11, and 15 - 17 under 35 U.S.C. §103(a) over the Bodin et al. Patent in view of U.S. Patent No 6,169,898 issued to Hsu et al., since these claims depend on an allowable base claim.

In view of the above amendments and remarks, Applicant believes the pending application is in condition for allowance. Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 50-1848, under Order No. 013217.0127C1US from which the undersigned is authorized to draw.

Respectfully submitted,
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